DON Mishap Reduction Goals

1-2 April 2008

Safety Baseline Proposal For FY09

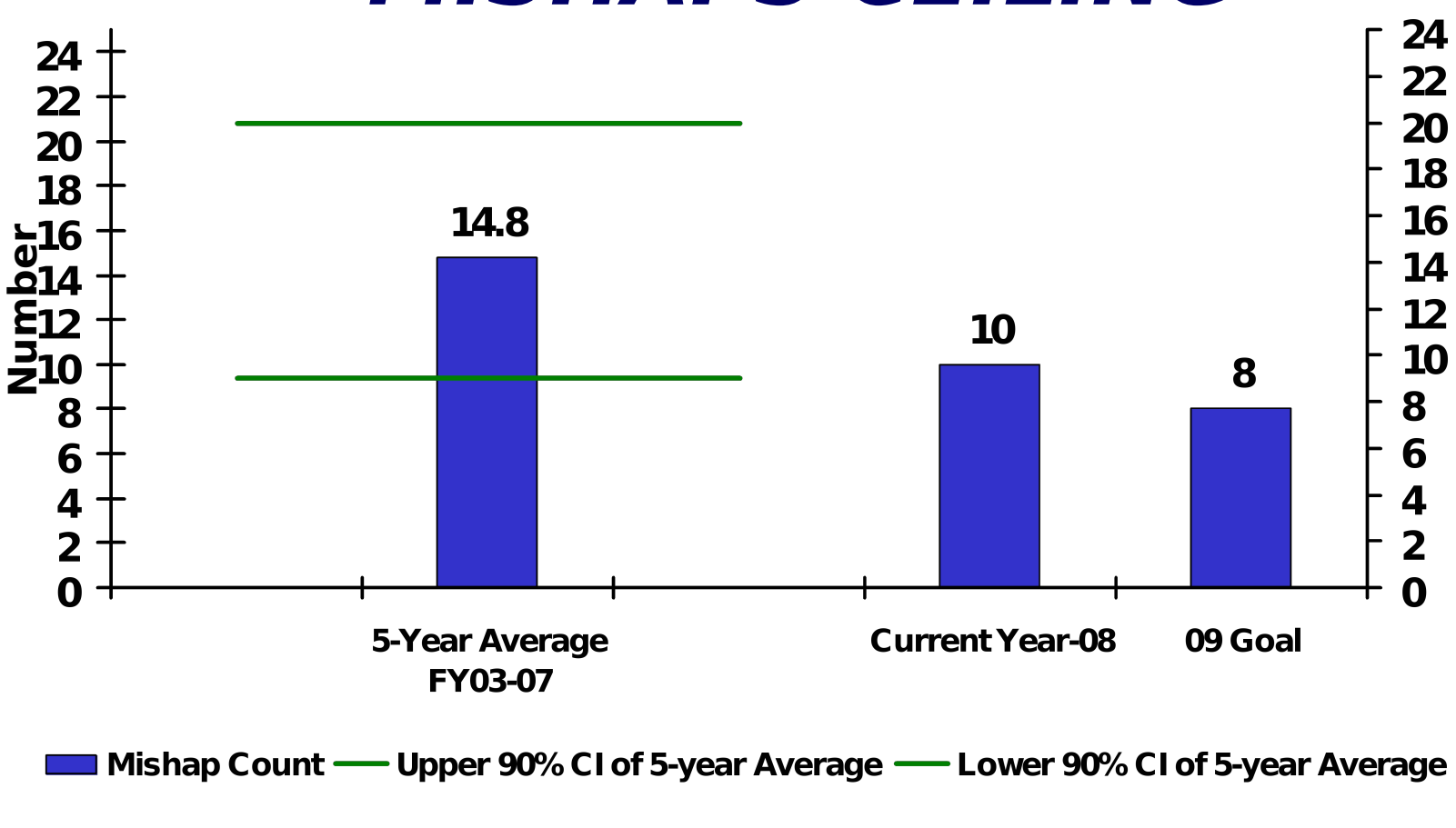
- Previous reduction goals based on snapshot
- Baseline should reflect broader picture
  - 5-year average
- Reduction goal should be:
  - Realistic
  - Have long-term effect
  - Sustainable

Determining Mishap Ceilings

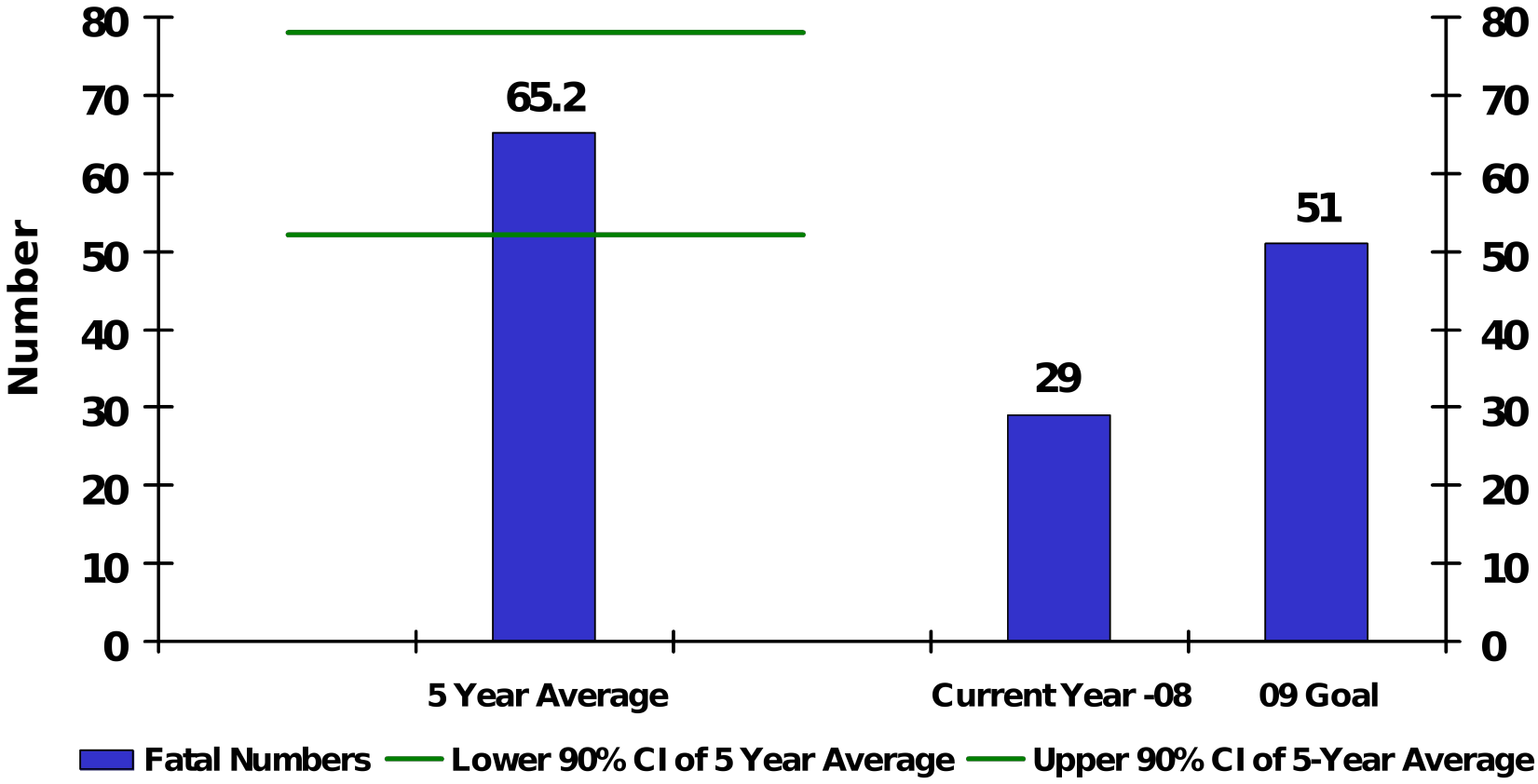
- Use 5-year average
- Determine 90% Confidence Interval using Poisson Distribution Function
- Ceiling (reduction goal) is first whole number below Confidence Interval

$$P(X = x|\lambda) = \frac{e^{-\lambda}\lambda^{x}}{x!}$$

CLASS A FLIGHT MISHAPS CEILING



PMV FATALITIES



Summary of Navy Ceilings

Category	5-year Average FY03-FY07	FY08 75% Reduction Goal	Proposed FY09 Goal
Navy Class A Flight Mishaps	14.8	3	8
Navy Class A Afloat Mishaps	8	2	3
Navy Class A Ashore Op Mishaps	3.2	0	0
Navy PT Fatalities	5.4	1	1
Navy Class A Op MV Mishaps	2.4	1	0
Navy Class A Op Mishaps	36.4	10	26
Navy Op Fatalities	21	7	13
Navy PMV Fatalities	65.2	16	51
Navy 4W PMV Fatalities	39	11	28
Navy 2W Fatalities	22.8	3	14
Navy Civilian Lost Work Days	34327	17677	28219

Conclusions

- Use 5 year average for baseline
- Calculate 90% confidence interval from Poisson Distribution
- Reaching goal implies successful reduction program in mishap category

BACK-UP

Determining Mishap Ceilings Steps: Step 1

- Find the average
  - Using the numbers from FY03-FY07 sum over the 5 years, dividing by the number of years, 5 to find the average

$$\frac{x_1 + x_2 + \ldots + x_n}{n}$$

Where n is the sum of years and x is the value of mishaps per FY

Navy Class A Flight Mishap	
FY	**Mishap**
2003	26
2004	12
2005	13
2006	14
2007	9
Average	14.8

Determining Mishap Ceilings Steps: Step 2

- Using the average, in our example, 14.8 the mean is the λ in the Poisson distribution function.
- Using Excel, the mean populates the table to the right
- To find the confidence interval, the upper interval is the last x value before the F(X) value is greater than 0.95 To find the lower interval, the x value is the first value equal to or greater than 0.05.

Cumulative and Point Values of a Poisson Distribution

Mean =	**14.8**				
x	P(x)	F(x)	1	0.086142	0.284513
0	3.7363E-07	3.7363E-07	1	0.098076	0.382589
1	5.52972E-06	5.90335E-06	1	0.103681	0.486269
2	4.092E-05	4.68233E-05	1	0.102298	0.588568
3	0.000201872	0.000248695	1	0.094626	0.683193
4	0.000746926	0.000995621	1	0.082378	0.765573
5	0.002210899	0.003206521	1	0.067735	0.833308
6	0.005453552	0.008660072	1	0.052769	0.886077

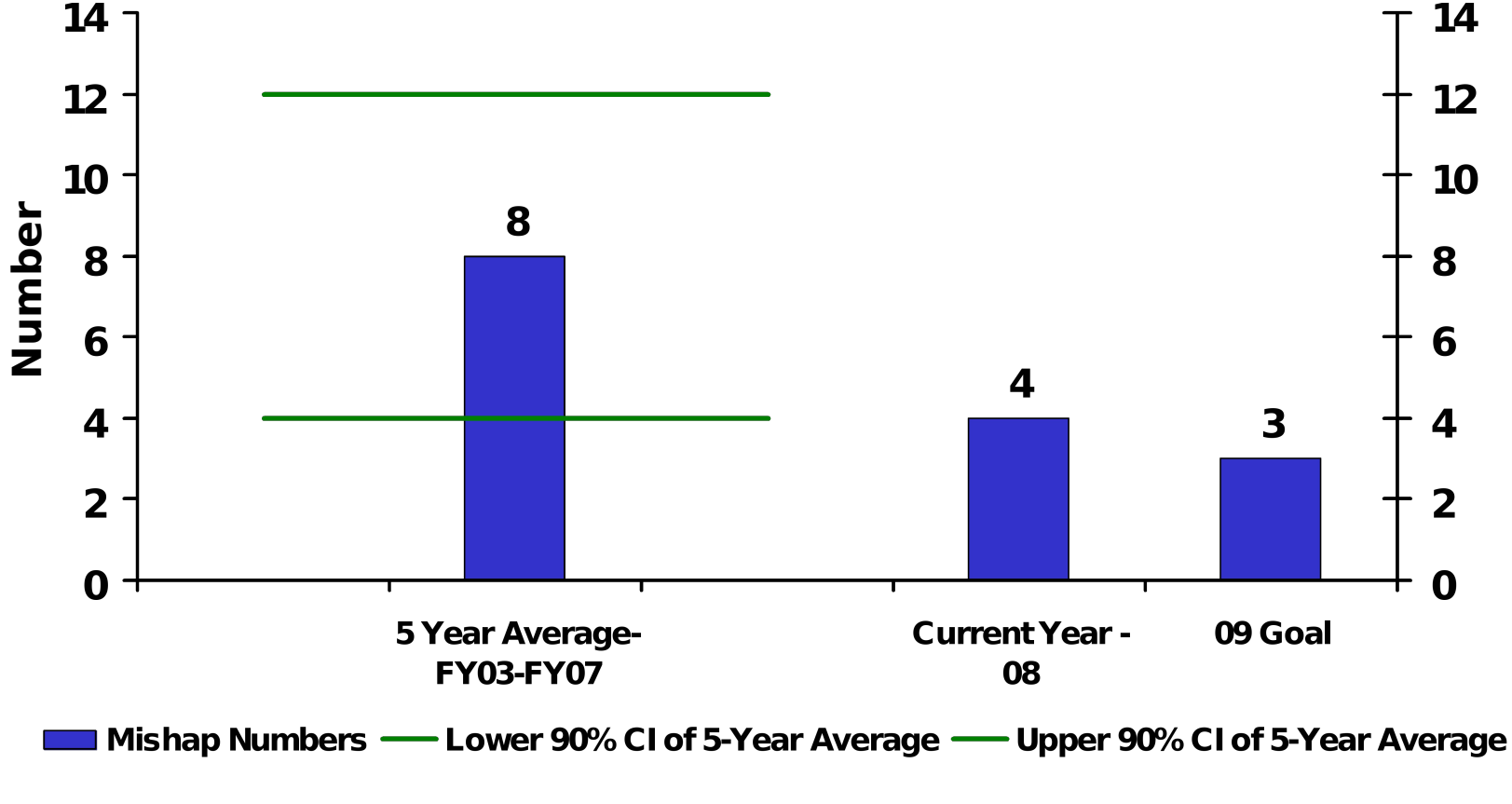
Determining Mishap Ceilings Steps: Step 3

- To find the goal for FY09, choose the first non-negative integer below the confidence interval
- Using the example, the 90% confidence interval of the 5-year average of Navy Class A Flight Mishaps is (9,20)
  - The first number below is 8 with a corresponding cumulative p-value of 0.041521619 (must be less than 0.05)

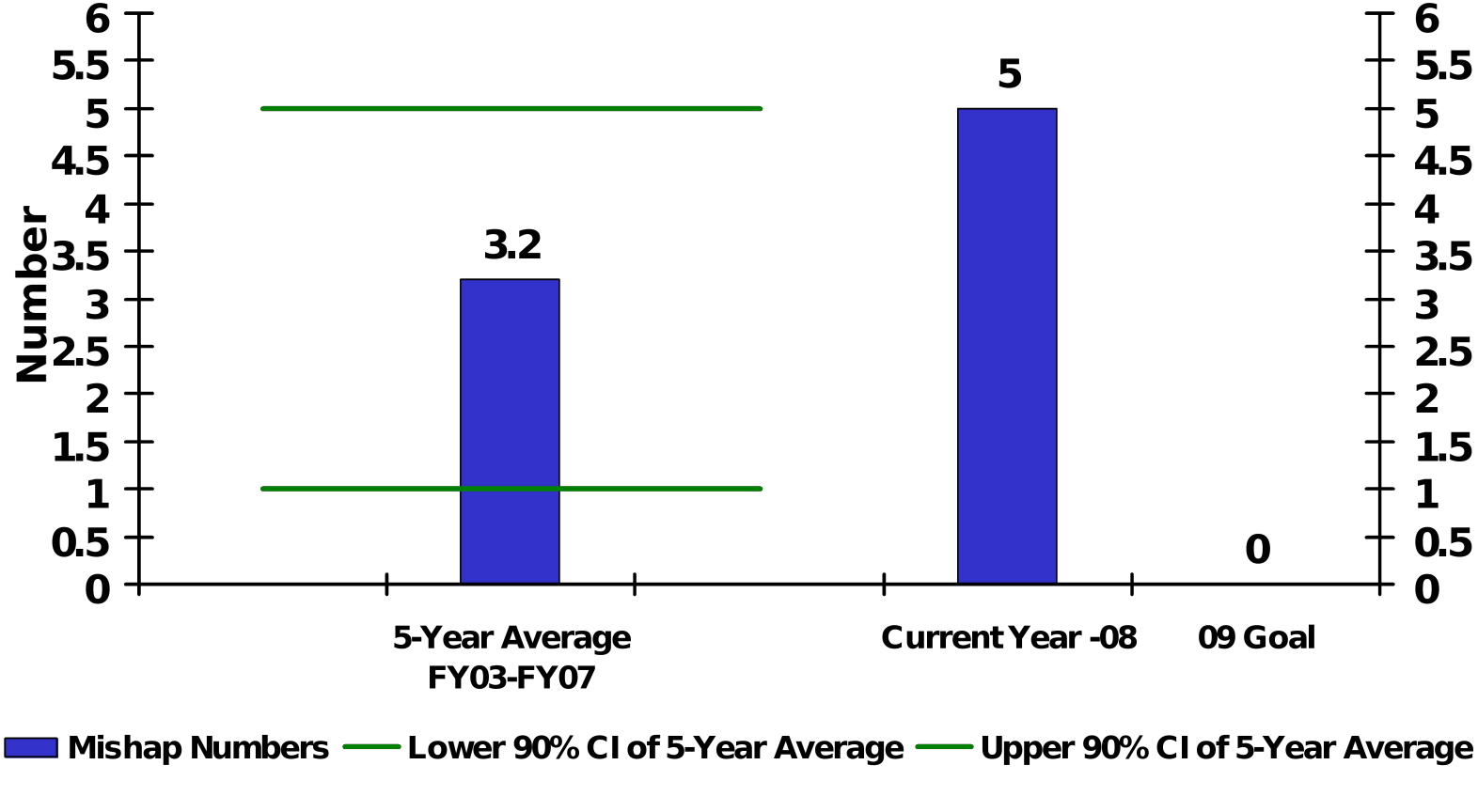
Determining Mishap Ceilings Steps: Step 4

- With the FY09 goal determined, the goal becomes a baseline for future years
  - Provides goals that have steady improvement
  - Consistency affects the goal
- Using the goal for FY09, steps 2 and 3 are repeated to find the goal for FY10.

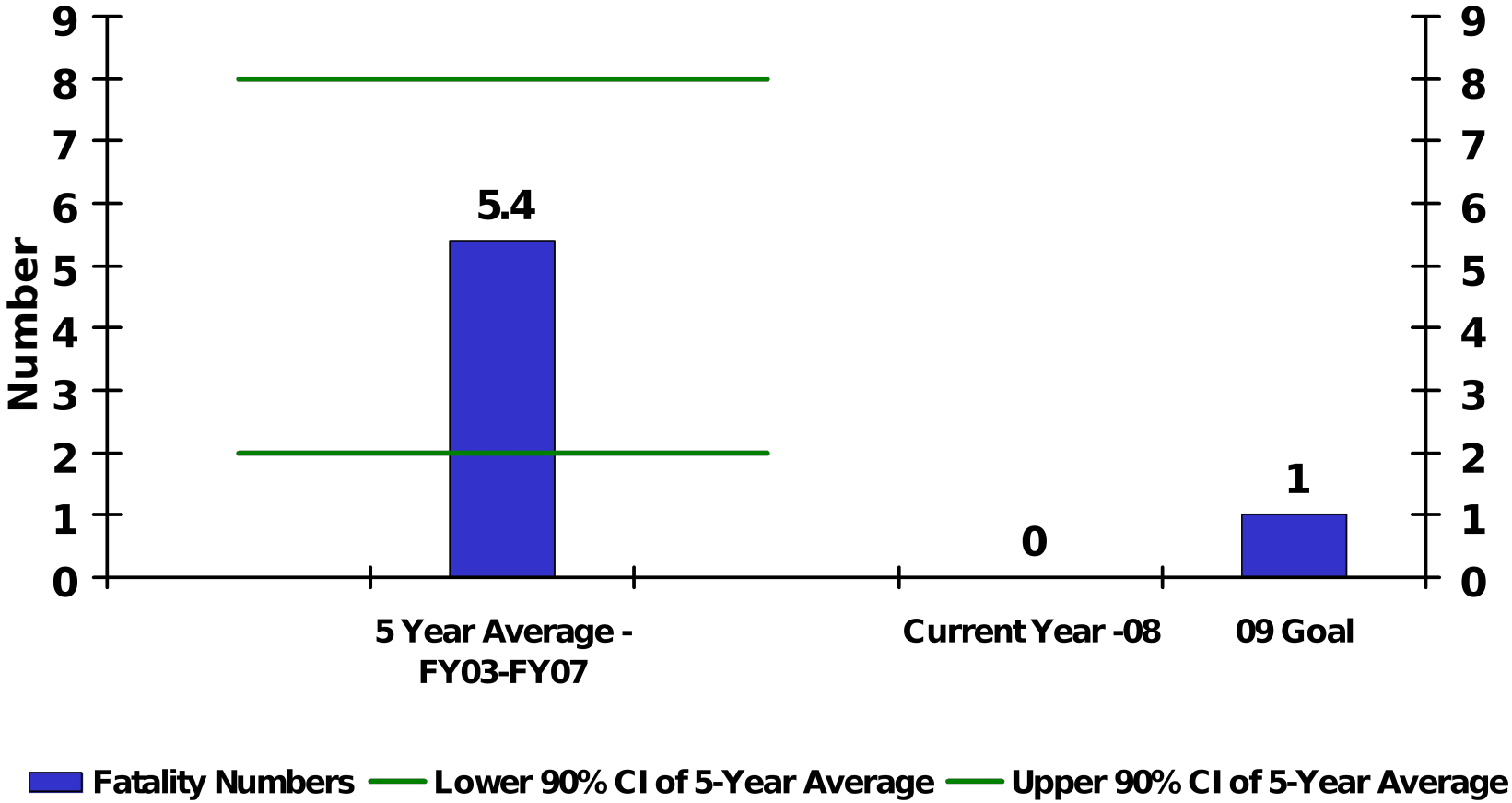
CLASS A AFLOAT MISHAPS



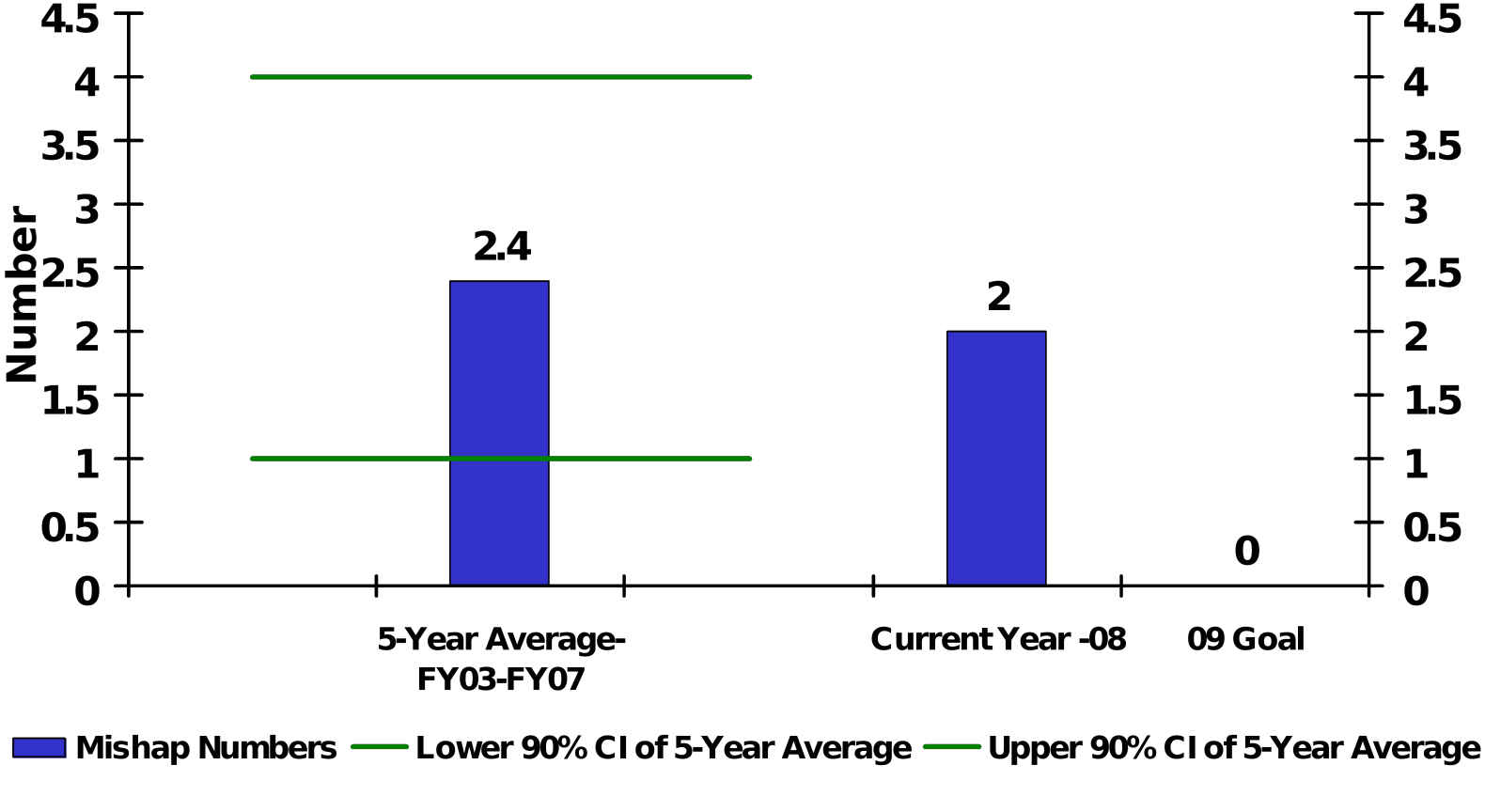
SS A SHORE OPER MISHAPS



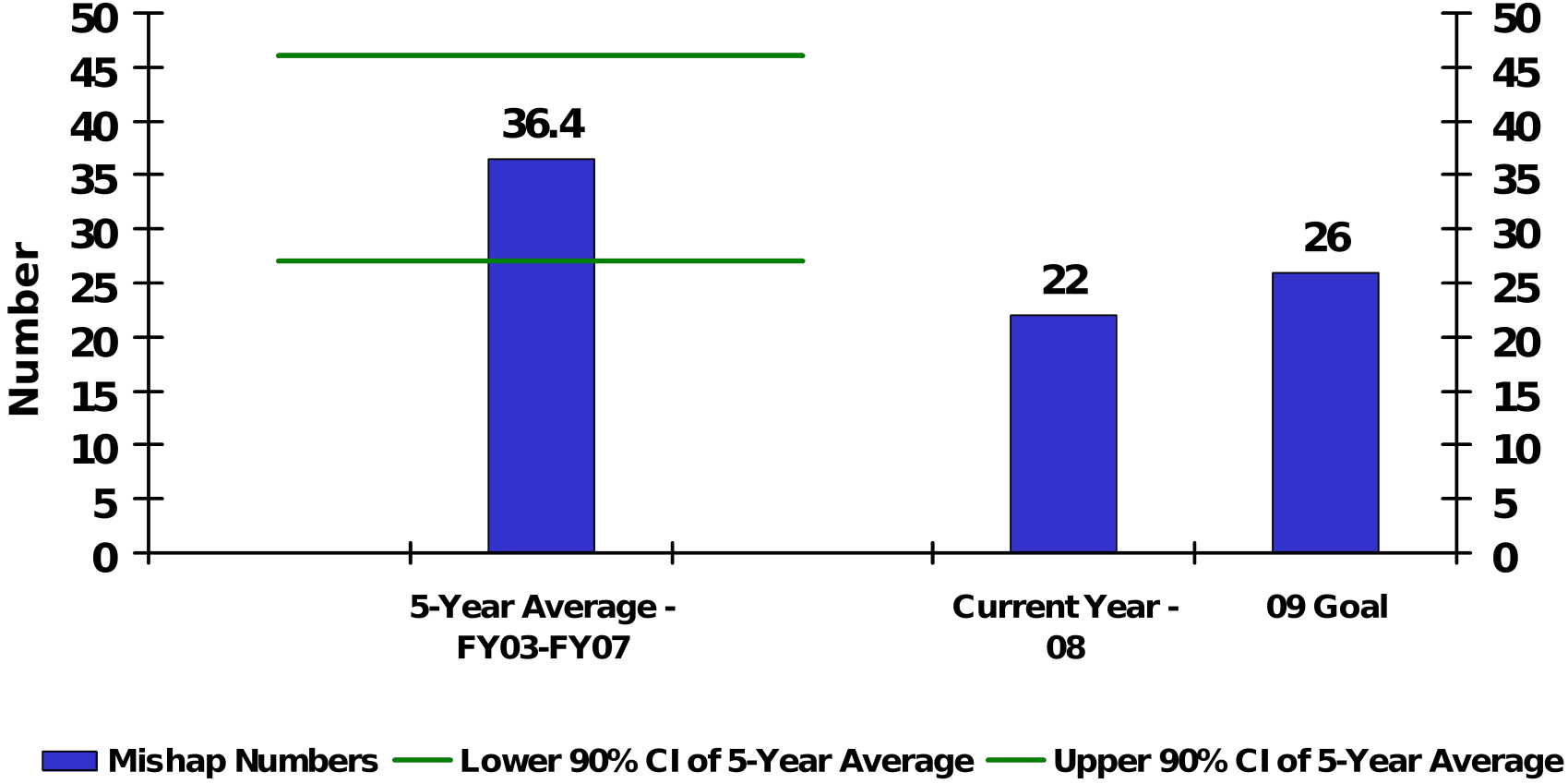
YSICAL TRAINING FATALITIES



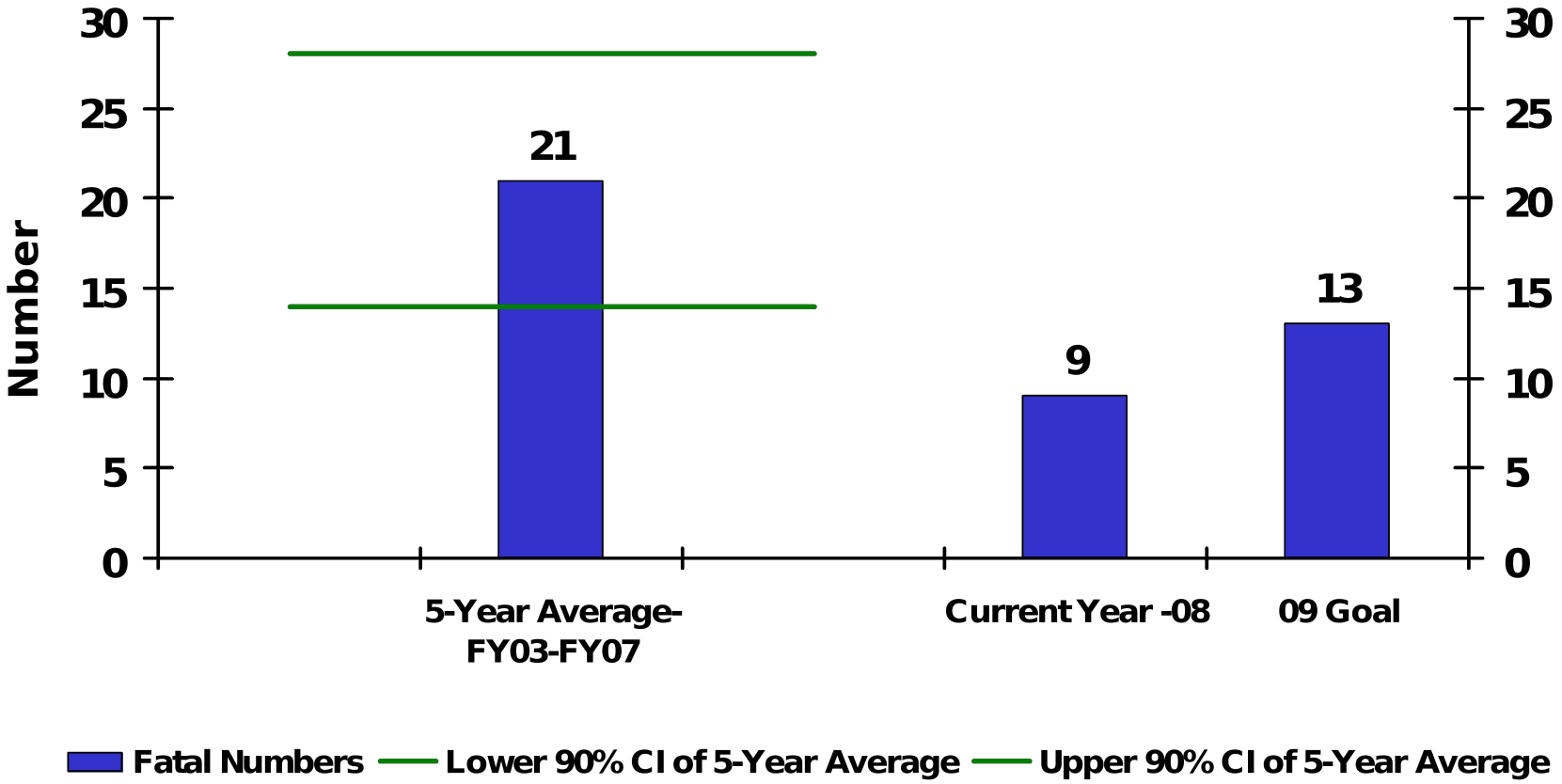
CLASS A OPER MV MISHAPS



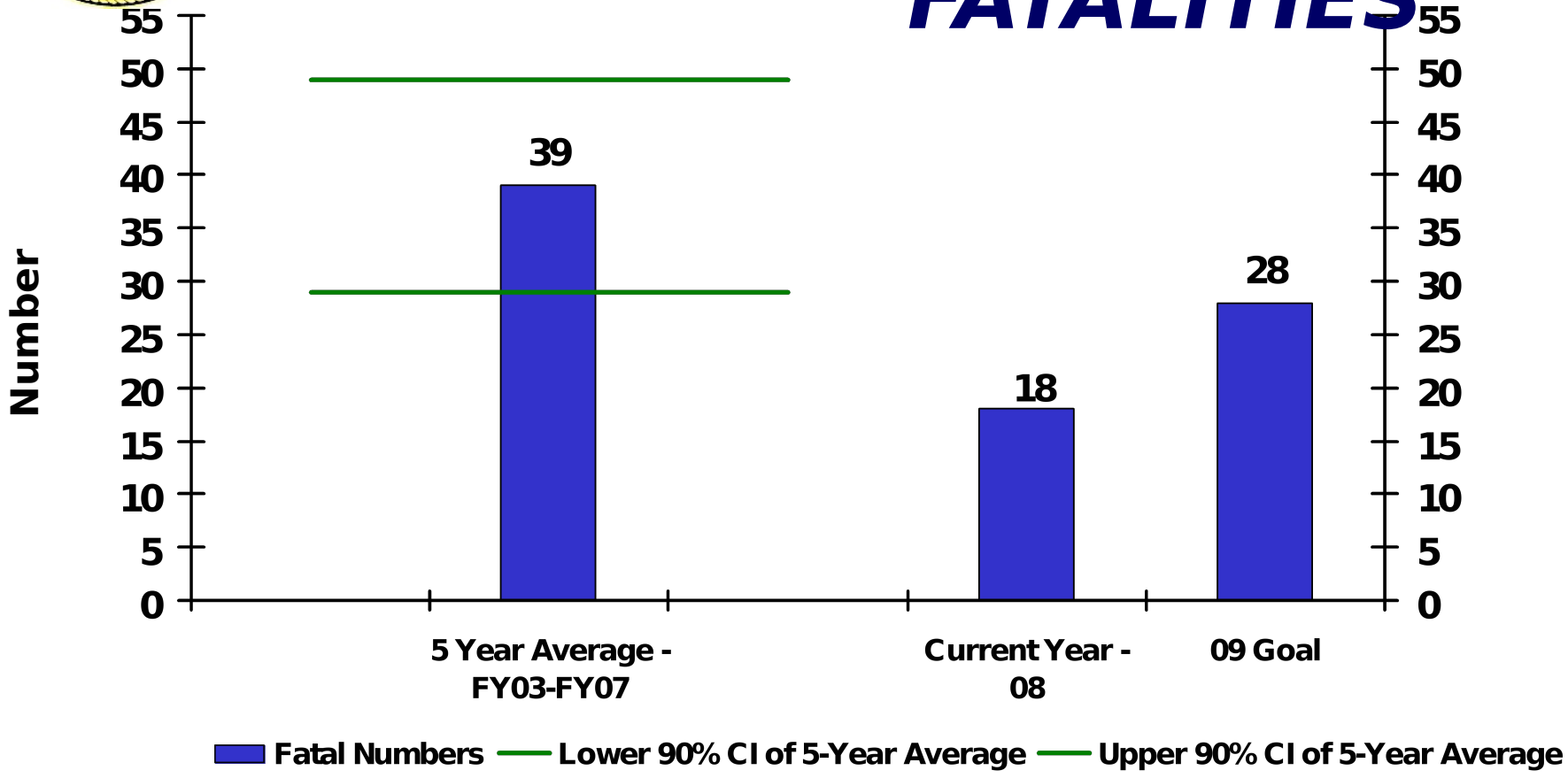
TAL CLASS A OPER MISHAPS



OPERATIONAL FATALITIES

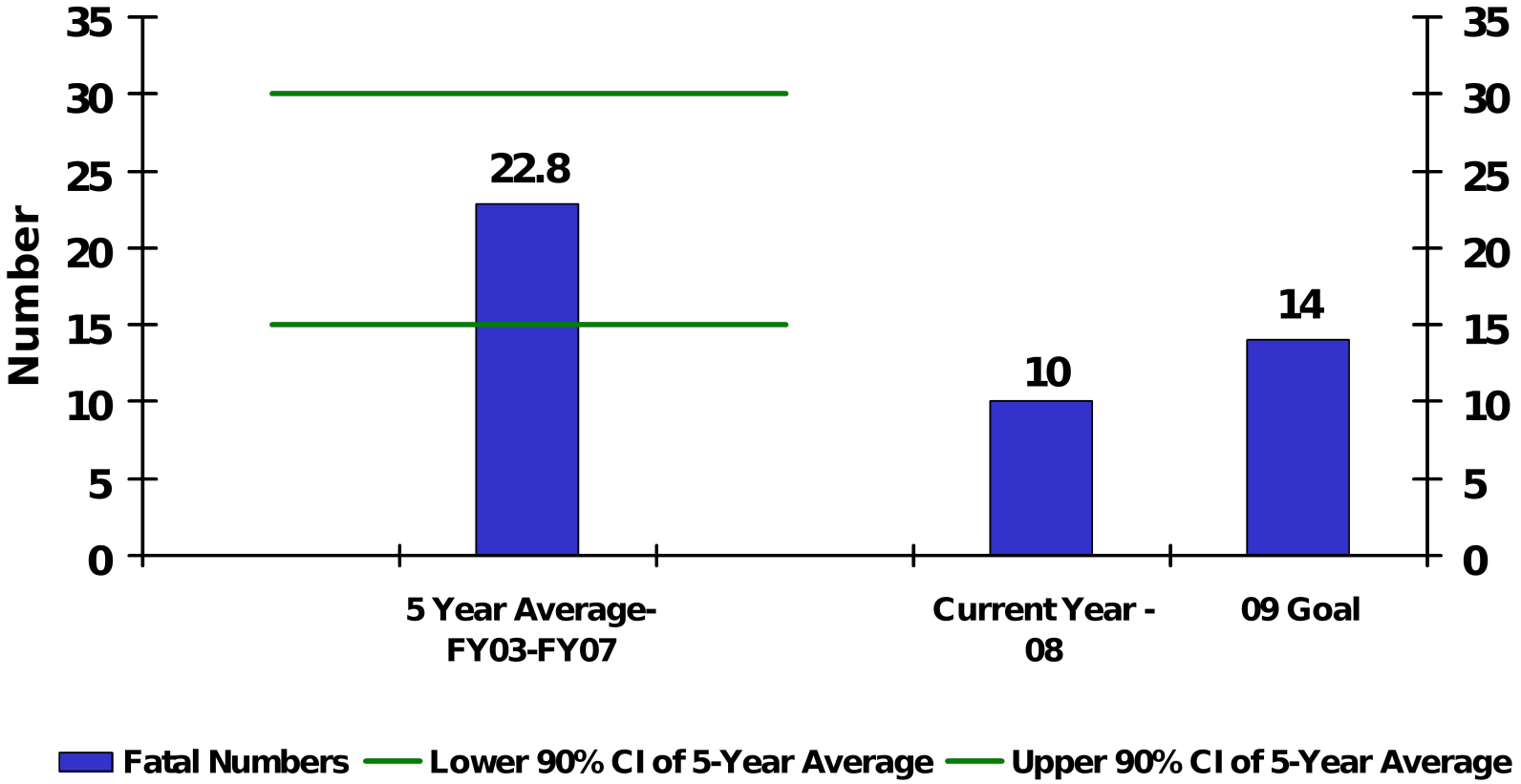


4-WHEEL PMV FATALITIES

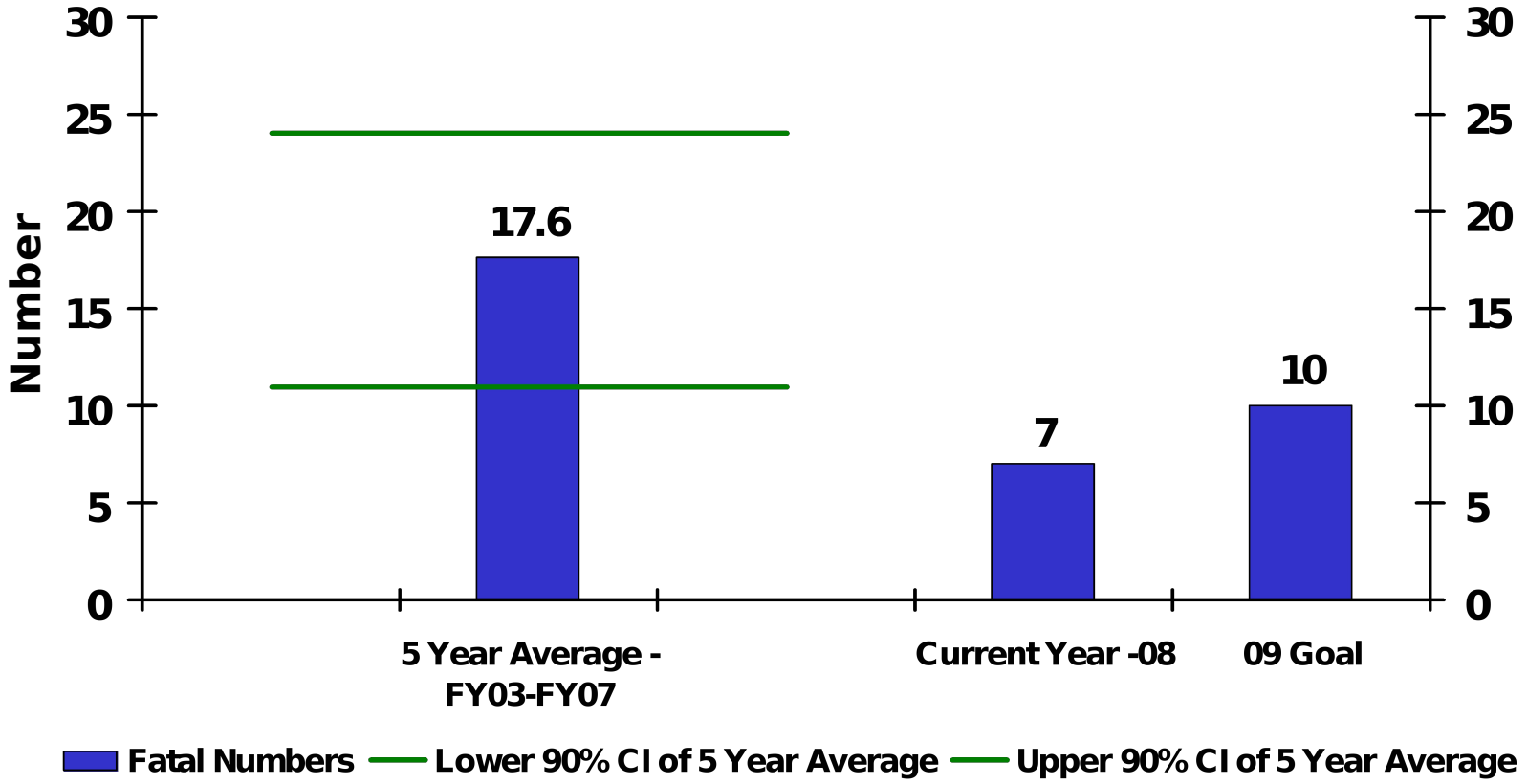


*pedestrian fatalities not included

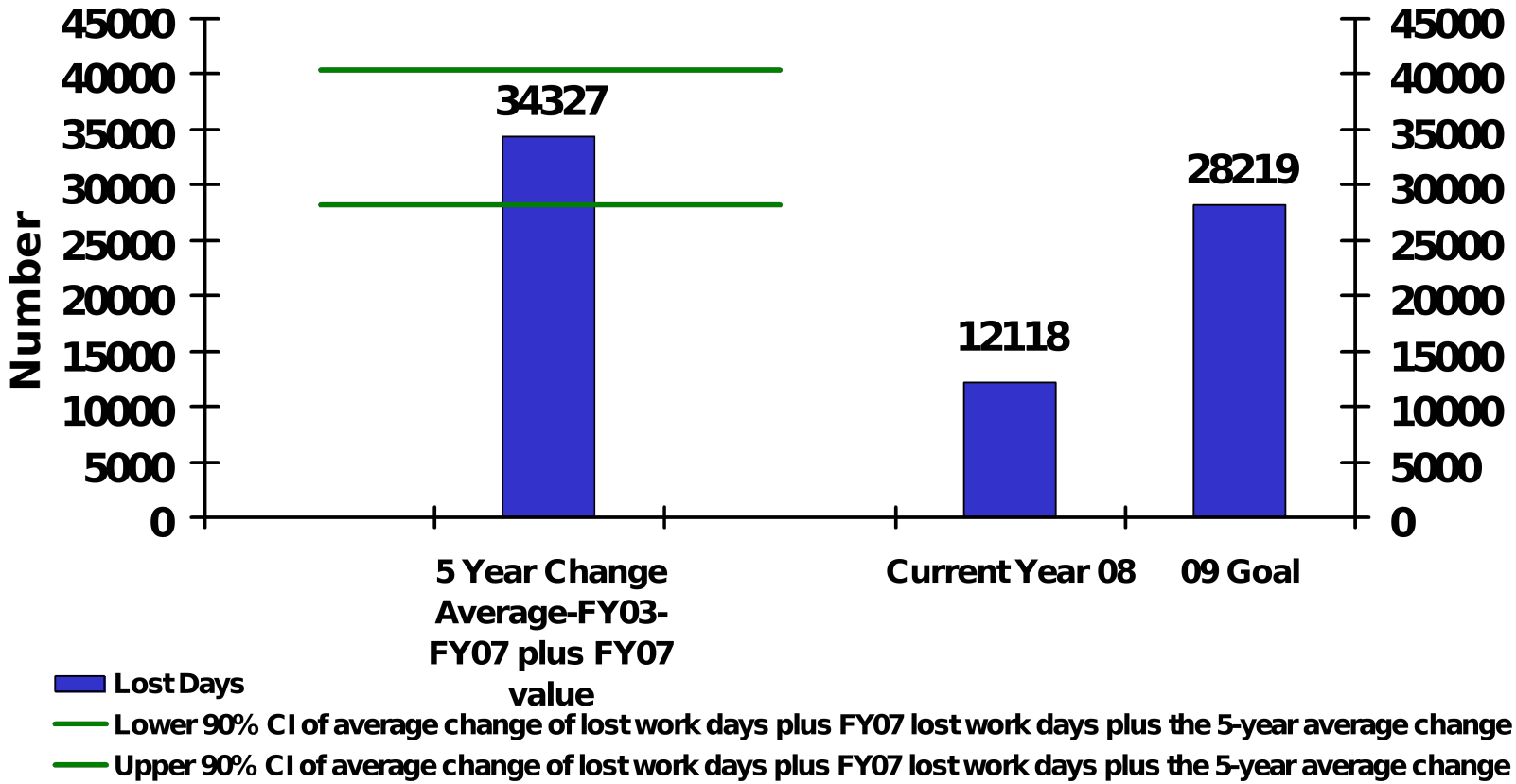
OTORCYCLE PMV FATALITIES



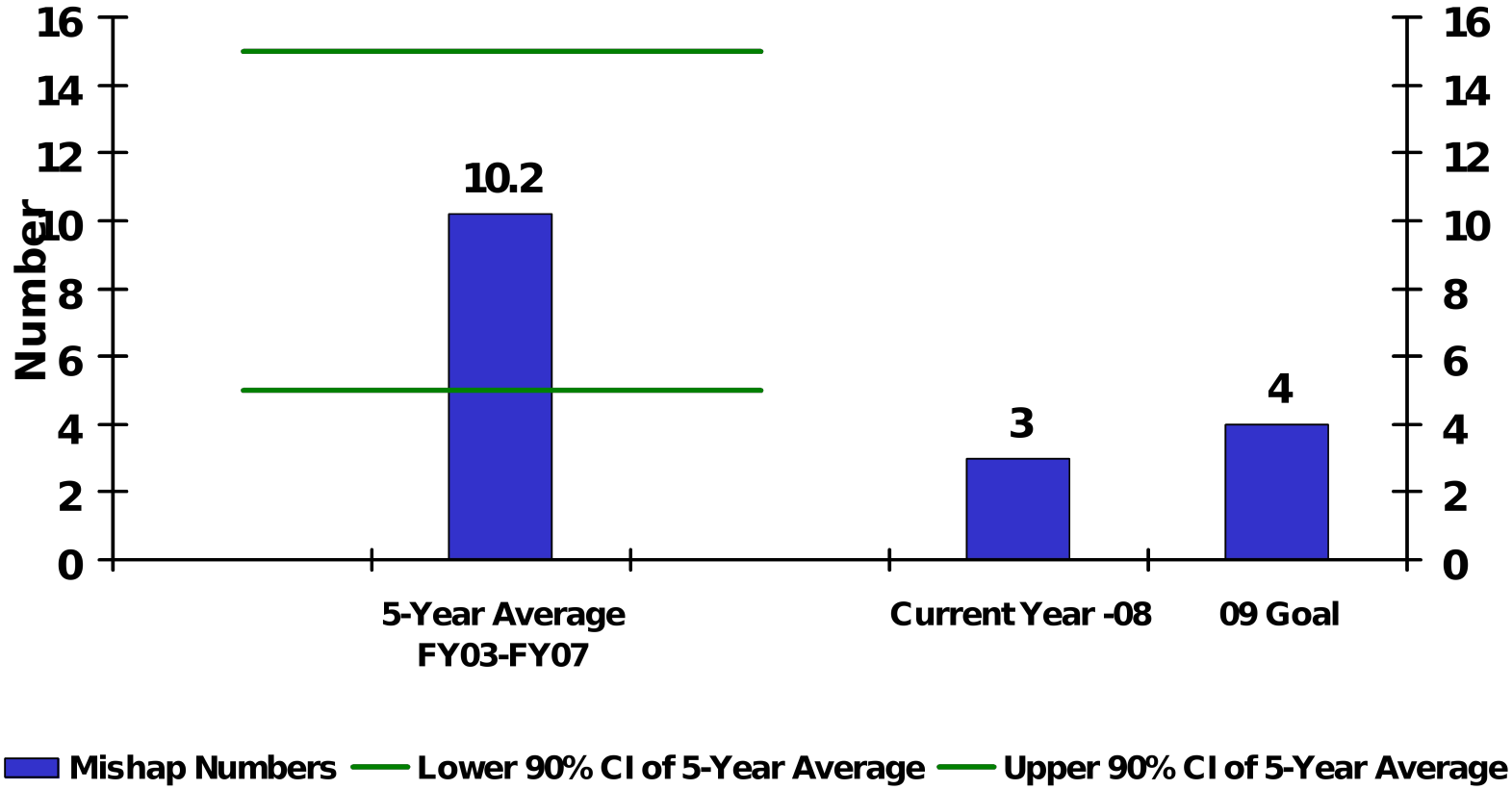
OFF-DUTY/REC FATALITIES



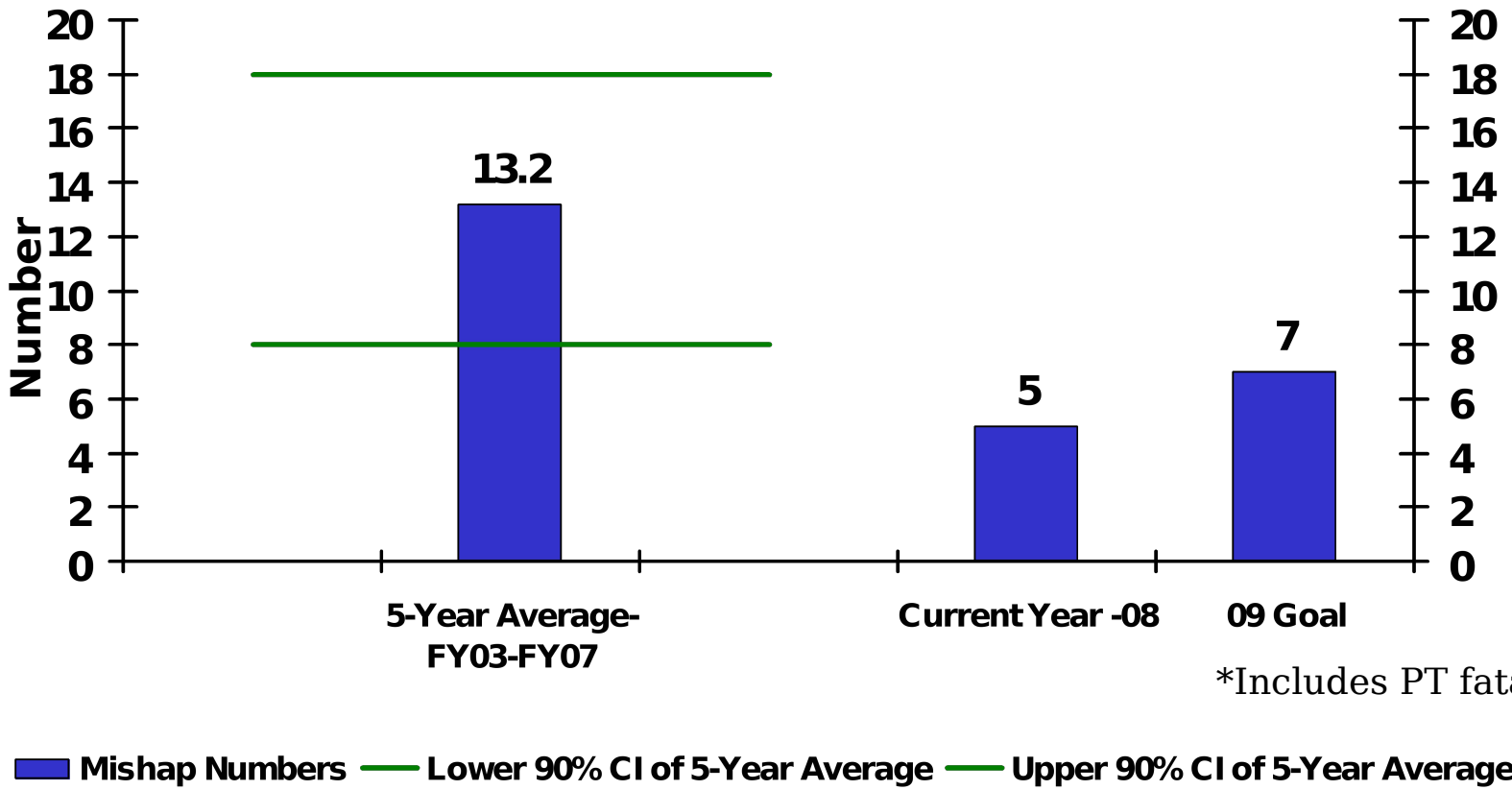
CIVILIAN LOST WORK DAY



CLASS A FLIGHT MISHAPS

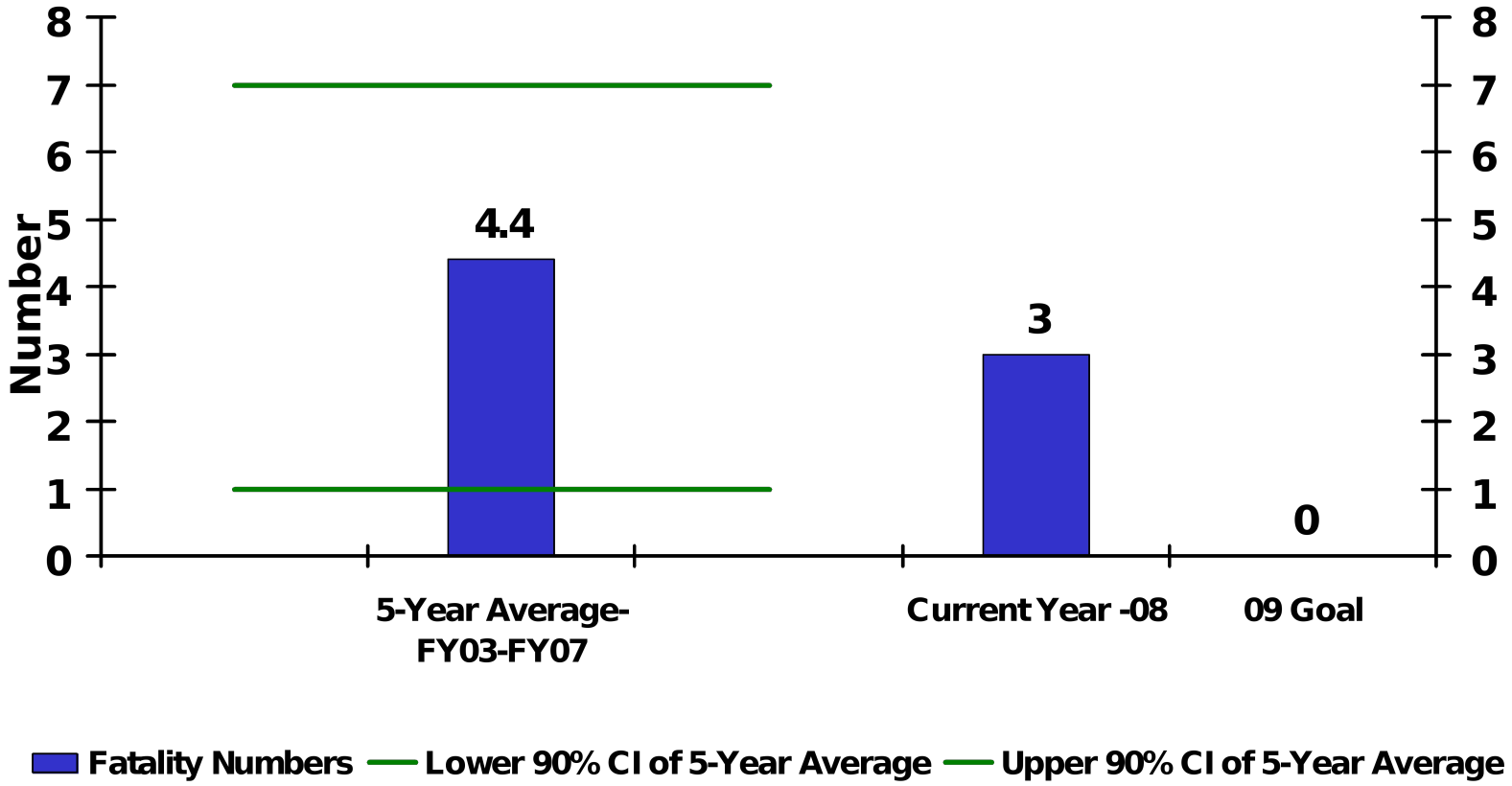


CLASS A GROUND OPER MISHAPS

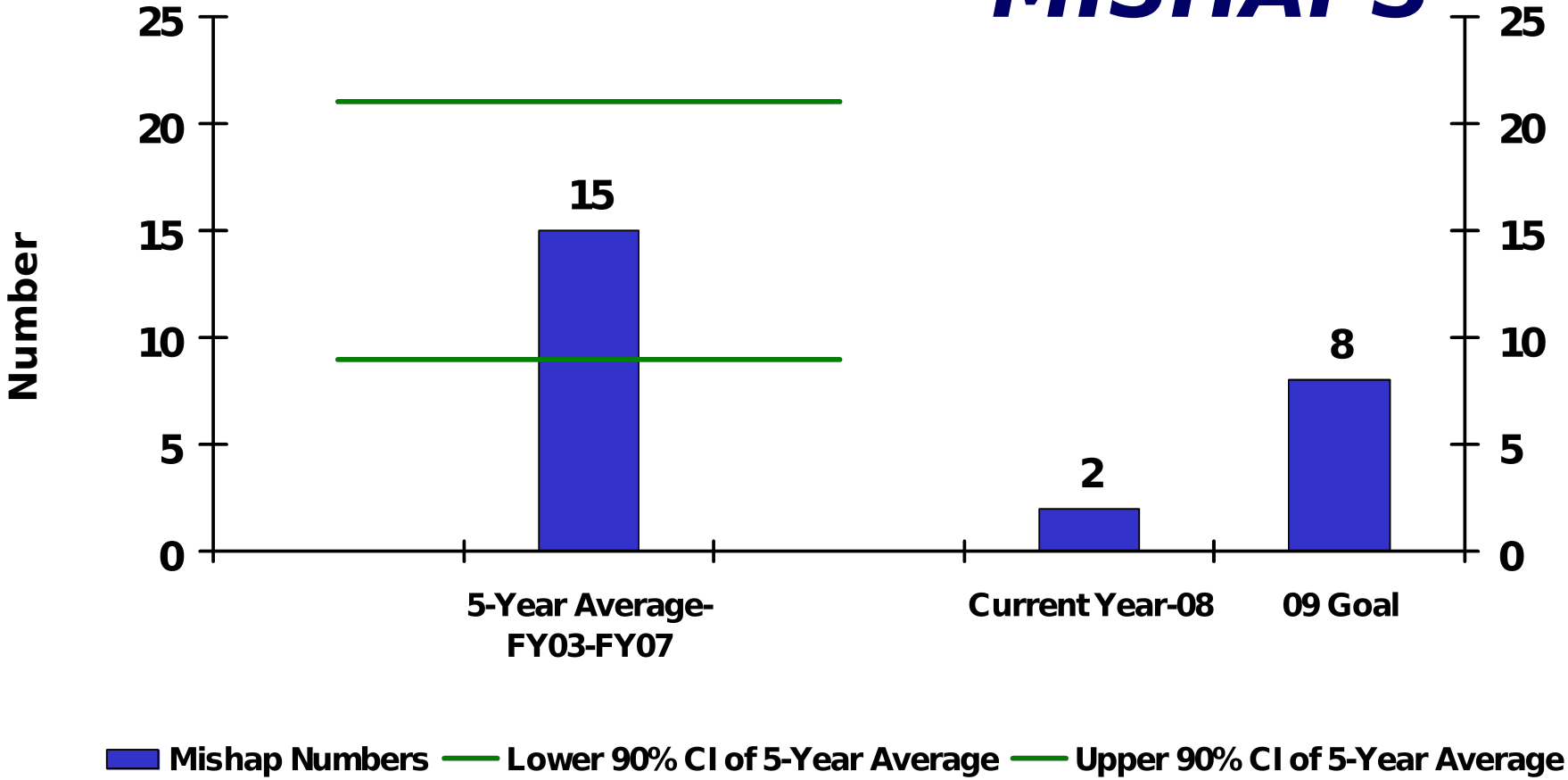


*Includes PT fatalities

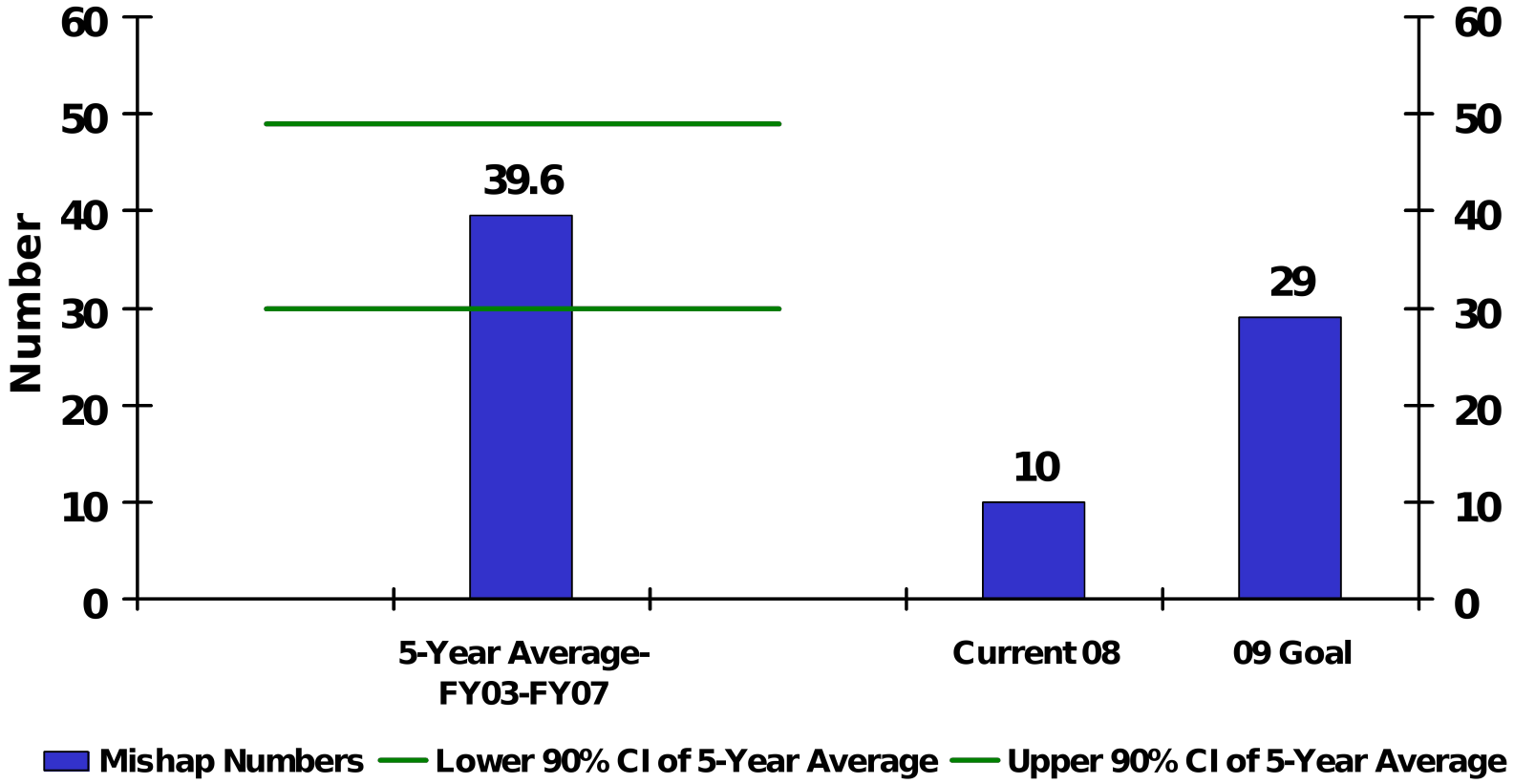
YSICAL TRAINING FATALITIES



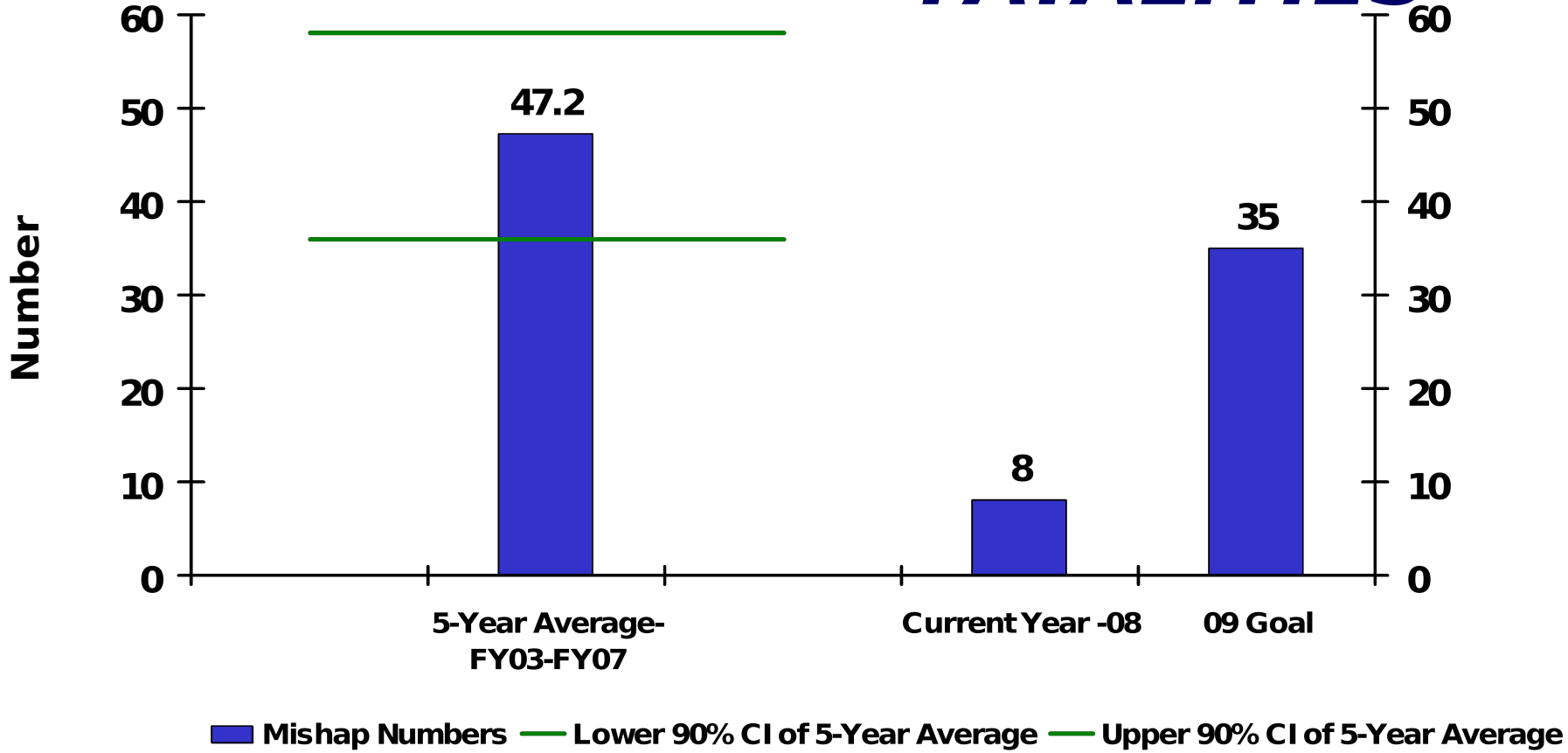
CLASS A OPER MV MISHAPS



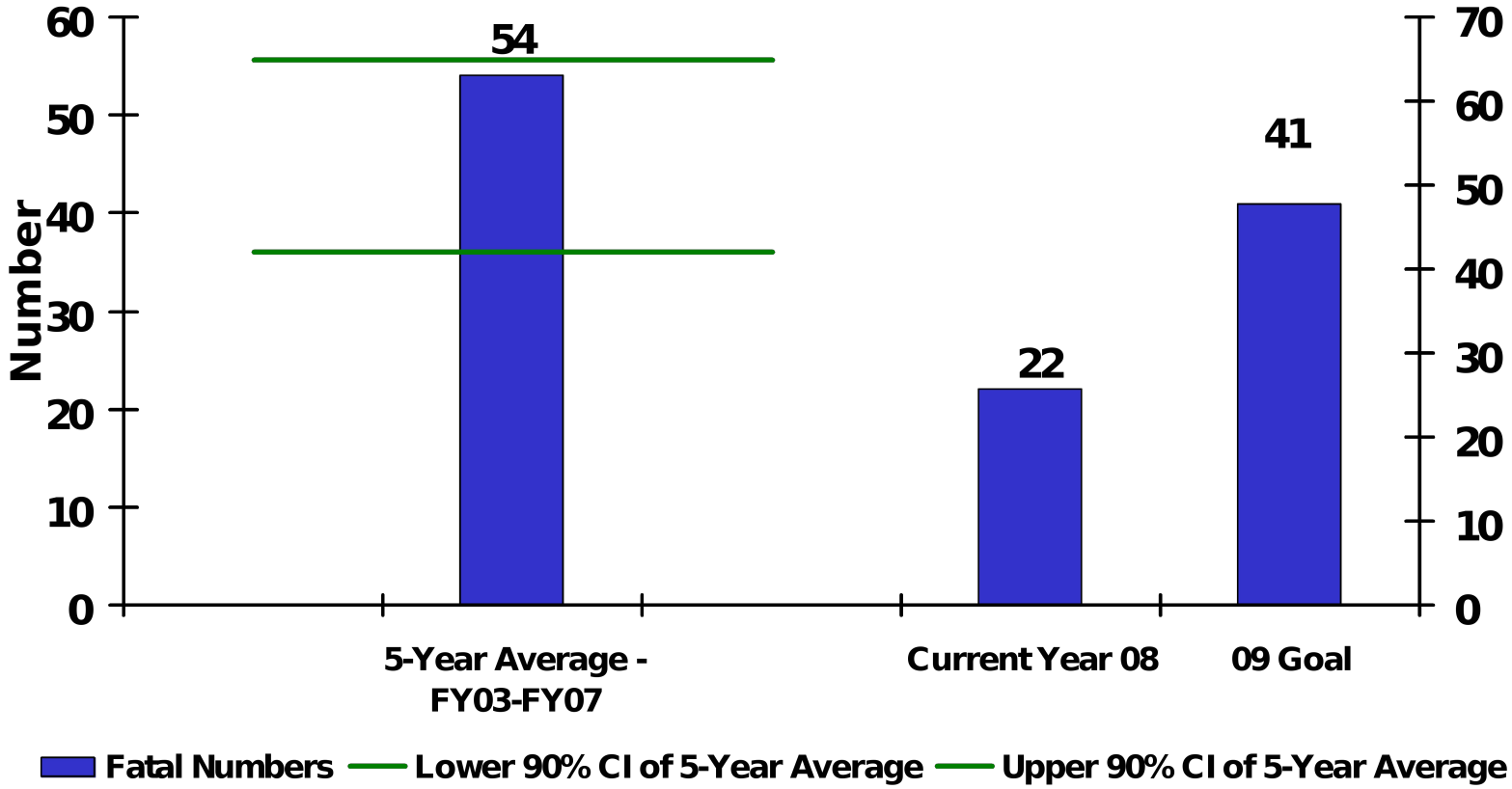
TAL CLASS A OPER MISHAPS



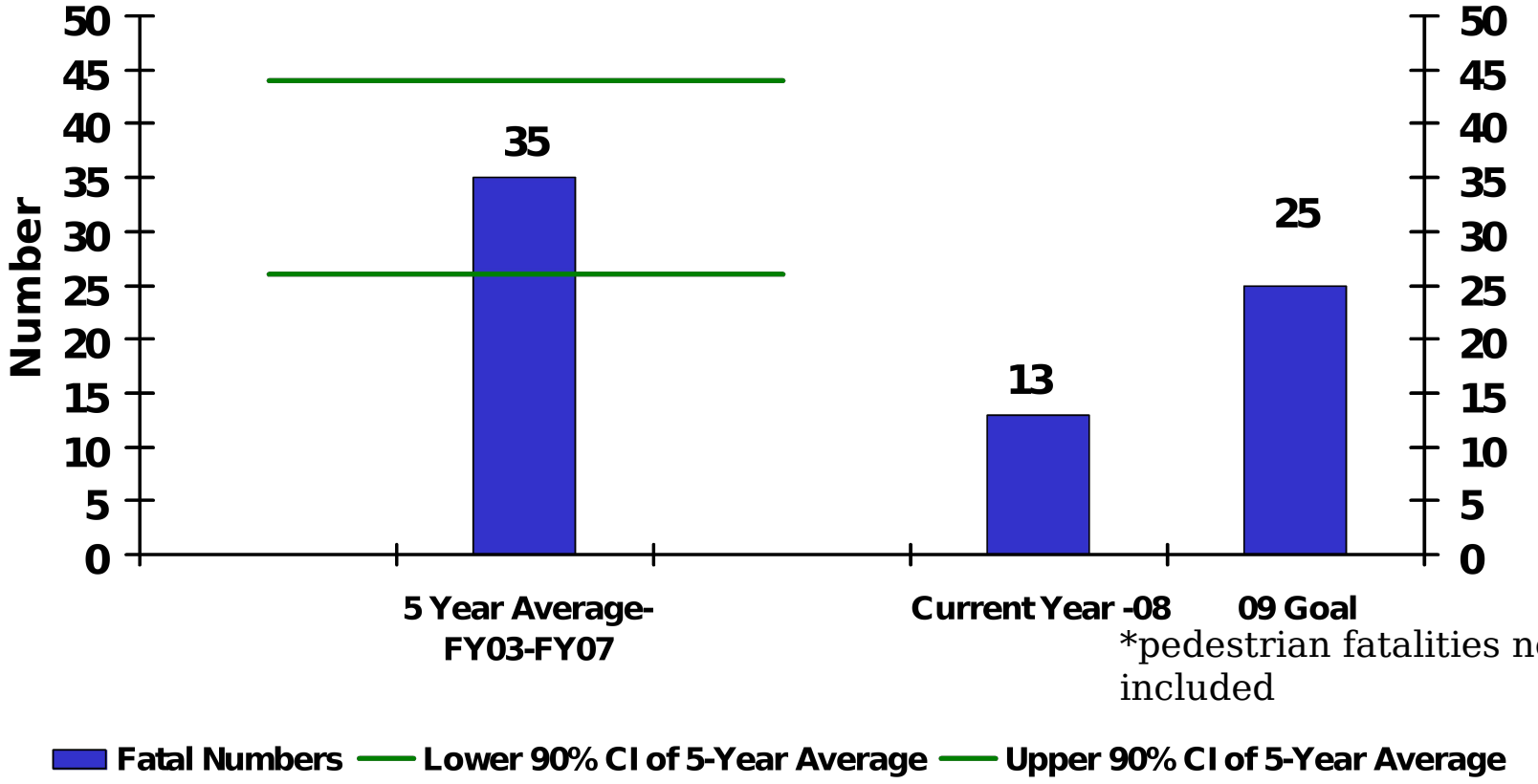
OPERATIONAL FATALITIES



PMV FATALITIES

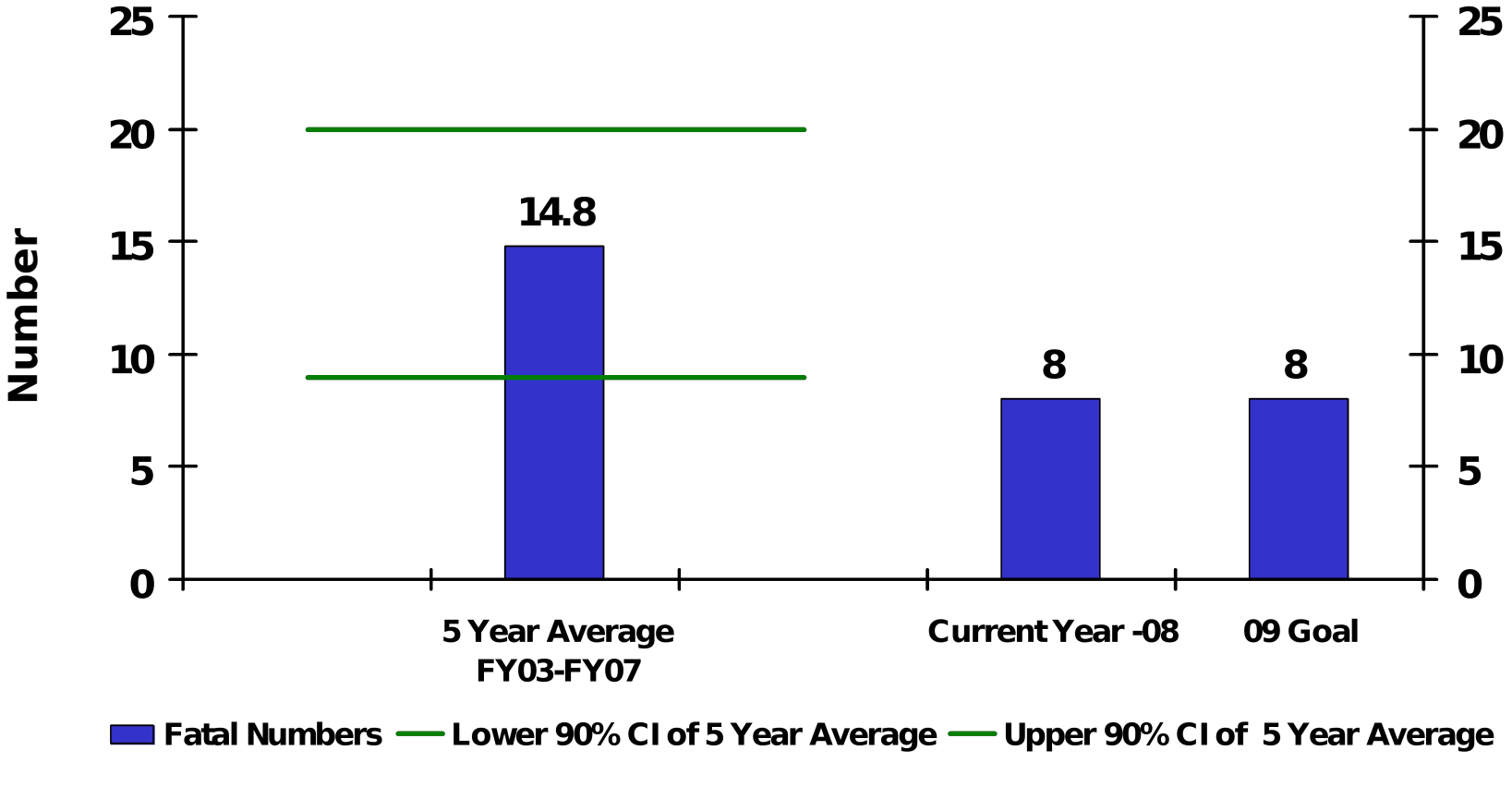


4-WHEEL PMV FATALITIES

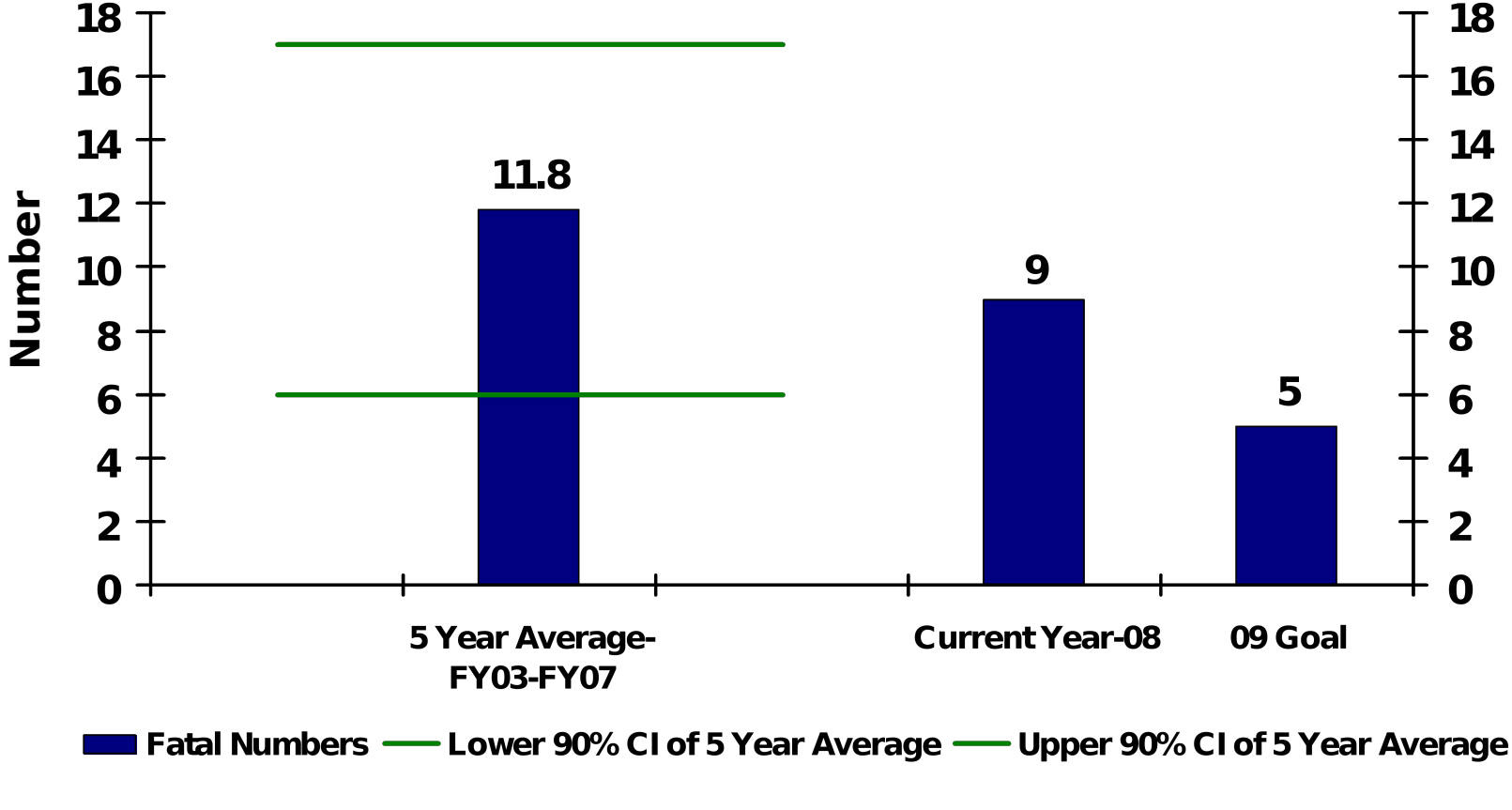


*pedestrian fatalities not included

OTORCYCLE PMV FATALITIES



OFF-DUTY/REC FATALITIES



CIVILIAN LOST WORK DAY